Marlin Network Access Servers

Extends Connectivity

Ensures Network Performance and Availability

Protects Investment

Bay Networks Marlin™ Network Access Server family is ideal for small- to mid-sized branch offices. The Marlin Network Access Servers provide all the features for environments requiring robust connections to IP intranets, the Internet, and Novell NetWare backbones, while supporting remote user access.

Bay Networks Marlin Network Access Servers feature a RISC-based multiprocessor design that offers best-in-class performance. Providing high filtering rates and forwarding performance, Bay Networks Marlin Network Access Servers meet the most demanding throughput requirements.

All Marlin Network Access Servers feature 10BASE-T Ethernet and Synchronous interfaces and are available with ISDN for connectivity flexibility. The Marlin Network Access Servers use Nautica™ Routing Services (NauticaRS) software to provide a comprehensive set of standards-based IP and IPX features and services, dial services, and multiple data compression algorithms. Point-to-Point Protocol (PPP) and Multilink PPP are also supported to provide standards-based connectivity over ISDN, Frame Relay, and leased lines.

Bay Networks provides an assortment of tools that allow the Marlin Network Access Servers to be easily configured. Additionally, Marlin Network Access Servers are fully SNMP manageable. They can be managed by a wide variety of platforms both locally and remotely across an ISDN link.

Combined with Bay Networks stackable hubs, switches, and remote access devices, Marlin Network Access Servers provide a cost-effective and flexible solution for providing remote office connectivity to the enterprise network.

Bay Networks

Benefits

Extends Connectivity

Marlin Network Access Servers support Ethernet, Synchronous, and ISDN BRI, providing flexible remote office and wide area connectivity. Bay Networks Dial Backup provides connectivity to the corporate backbone on an as-needed basis, ensuring cost-effectiveness. Bay Networks adherence to standards allows connectivity and interoperability for TCP/IP networks over ISDN, Frame Relay, and leased lines in multivendor environments.

Ensures Network Performance and Availability

By supporting 10,000 pps forwarding and 14,880 pps filtering rates, Marlin Network Access Servers ensure high-performance LAN access. What's more, the Marlin's Dial-on-Demand, Dial-Around-Dead Site(DADS), and Bandwidth-on-Demand features ensure network availability during periods of dislocation and high traffic congestion, offering protection against business disruption in the event of a discontinuity in the selected data path. Marlin Network Access Servers can be configured by a wide array of local and remote SNMP-based management platforms, which allow for easy configuration and quick problem resolution.

Protects Investment

The Marlin Network Access Servers are compatible with Bay Networks CLAM,™ Access Node (AN®), Access Node Hub (ANH™), Access Stack Node (ASN™), Backbone Link Node (BLN®), and Backbone Concentrator Node (BCN®) routers. Additionally, Marlin Network Access Servers can interoperate with third-party vendors equipment using PPP, Multilink PPP, Bandwidth Allocation Control Protocol (BACP), Compression Control Protocol (CCP), and Microsoft Point-to-Point Compression.

Hardware Features

High-Performance Processor

The high-performance, highly flexible Marlin Network Access Servers feature a MIPS 33000, MC68360, and an MC68302 microprocessor for I/O interface, providing a filtering rate of 14,880 pps and forwarding performance that exceeds 10,000 pps.

Each Marlin Network Access Server contains 4 megabytes (MB) RAM and 1 MB Flash memory. Software image and configuration files can be downloaded remotely to the Flash memory, simplifying upgrades and fault recovery procedures.

LAN and Serial Interfaces

Marlin Network Access Servers are available in configurations that support Ethernet, Synchronous, and ISDN BRI to meet a wide variety of connectivity requirements.

Ethernet All Marlin Network Access Servers feature a 10BASE-T (RJ-45) connector and one AUI connector for a choice of connectivity. The interface supports IEEE 802.3 and Version 1.0/2.0 Ethernet frame formats.

Synchronous The Synchronous WAN interface supports clocking rates up to 2.044 Mbps. It is available configured with a V.11/X.21, V.24/RS-232, or V.35 physical interface for support of Frame Relay or leased line services. The V.24 interface also supports connection to an analog modem for public-switched telephone network (PSTN) dial-up routing.

Integrated Services Digital Network (ISDN) Basic Rate Interface (BRI) Marlin Network Access Servers' support of ISDN BRI supplies two 64 Kbps B-channels for data and one 16 Kbps D-channel for signaling to provide an integrated, high-performance solution for companies using dial services. Marlin Network Access Servers' ISDN BRI connector is an RJ-45. The Marlin Network Access Servers can be equipped with up to three ISDN S/T interfaces.

Software Features

Nautica Routing Services (NauticaRS)

Available for all Marlin Network Access Servers, NauticaRS software enables the Marlin to maximize connectivity through standards-based protocol features and services (see Table 1). Nautica RS supports static and IP routing, RIP and RIP version 2, and Novell IPX/SPX. It also complies with Point-to-Point Protocol (PPP) and Multilink PPP (MP) standards to provide connectivity for TCP/IP networks over ISDN, Frame Relay, and leased lines to other third-party routers. NauticaRS support of RFC 1490 encapsulation enables multivendor interoperability for Frame Relay networks. It also features Transparent bridging. NauticaRS supports several standards-based data compression algorithms to ensure high-performance networking.

Table 1 | **Nautica Routing Services for Marlin Routers**

Feature	NauticaRS Software
ISDN	
EURO-ISDN	√
National ISDN-1 (NI-1)	√
National ISDN-2 (NI-2)	√
AT&T Point to Point	√
AT&T Multipoint	√
Sub-Addressing	√
Multiple Subscriber Numbering	√
Caller ID	√
Virtual Private Telephone Network Dialing codes	√
Circuit Switched Voice/Data over Voice provisioned B channels	√
Supplemental Telephone Service (U.S., Sweden)	
Call Forwarding	√
Call Waiting	√
Recall	√
Call Hold/Call Retrieve	√
Synchronous Interface Support	
External Asynchronous Modem Support using V.24/RS-232 port	√
Point-to-Point Protocol (PPP)	
Link Control Protocol (LCP) Extensions	√
IP Control Protocol (IPCP)	√
IPX Control Protocol (IPXCP)	√
Bridge Control Protocol (BCP)	√
Multilink Link PPP (MP)	√
Compression Control Protocol (CCP)	√
PPP STAC LZS Compression Protocol	√
PPP Authentication Protocols (PAP/CHAP)	√
Bandwidth Allocation Protocol (BACP)	√
Routing IP over PPP	√
Routing IPX over PPP	√
Bridging over PPP	√
Spanning Tree support	√
Frame Relay	
Multiprotocol Interconnect over Frame Relay	√
Routing IP over Frame Relay	√
Routing IPX over Frame Relay	√
802.1D Bridging over Frame Relay	√
Nautica HDLC	
HDLC w/STAC LZS	√
802.1D Bridging over HDLC	√
IP Routing over HDLC	√
IPX Routing over HDLC	√

Table 1 **Nautica Routing Services for Marlin Routers (continued)**

Feature	NauticaRS Software
Security	
Calling Line Identification (CLI)	√
Secure Unit	√
PPP PAP/CHAP	√
Network Filters	√
Port/Socket Filters	√
ISDN Dialback	√
RADIUS Client	√
Optimization Features	
Bandwidth-on-Demand	√
Dial-on-Demand Routing	√
Extended Call Filtering	√
IP RIP Direction Control	√
IPX RIP and SAP Direction Control	√
Single Host Address Working	√
Cul-De-Sac Routing	√
Minimum Call Duration Timer	√
DHCP Server	√
DHCP/BootP Relay	√
Compression	
CCP/STAC-LZS	√
Microsoft Point-to-Point Compression (MPPC)	√
Bay Networks WCP for PPP	√
Protocol Spoofing	
IPX/SAP	√
IPX/RIP	√
IPX/Watchdog	√
IPX/Serialization	√
IP/RIP	√
Management	
Bay Command Console (BCC)	√
Telnet	√
SNMP	√
SeaView	√

NauticaRS Protocol Implementation

NauticaRS provides a comprehensive set of standards-based IP, IPX, Frame Relay, and PPP features and services.

IP NauticaRS provides all standard IP functions and supports major Internet Engineering Task Force (IETF) Request for Comments (RFCs) for protocols including IP, TCP, RIP, ARP, ICMP, UDP, DHCP, BootP Relay, Dynamic RIP routing, and static routes. This range of support ensures users highly reliable, standards-based connectivity and interoperability.

Marlin Network Access Servers' IP implementation provides increased network security and reduced overhead traffic through its IP RIP Direction Control feature. This feature controls the flow of broadcast traffic over the network. Broadcast traffic generated by IP RIP can be configured as send only, receive only, both, or neither on a per-path basis.

NauticaRS also allows static routes to be "blacklisted" to allow DADS to be supported for dynamic and static routing table entries. This provides greater resilience in a meshed ISDN environment.

IPX The Marlin Network Access Servers' IPX implementation supports LSAP/LLC2, SNAP, and Novell Proprietary protocol. RIP routing is also supported to ensure that the best path to a destination is used. Additionally, the Marlin's IPX Default Route feature enables packets to be sent to an address that is not known in the Marlin Network Access Servers' routing table. Bay Networks also reduces traffic on the network through its SAP and SPX spoofing support.

The Marlin Network Access Servers' IPX implementation provides increased network security and reduced overhead traffic through its IPX RIP and SAP Direction Control feature.

Frame Relay Bay Networks NauticaRS Frame Relay support allows remote access to corporate networks or the Internet over public or private Frame Relay networks. Marlin Network Access Servers can support up to 64 PVCs over a Frame Relay network. This Frame Relay implementation supports RFC1490 encapsulation, ensuring multivendor interoperability over Frame Relay for IP/IPX routing and transparent bridging.

PPP and Multilink PPP Industry-standard Point-to-Point Protocol (PPP) and RFC 1990 — Multilink PPP (MP) — are supported for multivendor interoperability over ISDN and leased lines. PPP and MP are enhanced by the Marlin Network Access Servers' support of Point-to-Point Tunneling Protocol (PPTP), Bridge Control Protocol (BCP), and Bandwidth Allocation Control Protocol (BACP), which extend connectivity, ensure adequate bandwidth, and provide security.

PPTP allows PC users to extend the PPP connection over a composite path of LAN and ISDN links. An extension of PPP, PPTP supports virtual private networks (VPNs) and provides branch office and remote/mobile users low-cost access to corporate network resources via a secure Internet connection. This eliminates long distance charges as well as management and security issues associated with maintaining private networks. BCP allows non-routed protocols such as AppleTalk to be bridged over a PPP link to any other router or bridge supporting the PPP/BCP standard.

Bandwidth Allocation Control Protocol (BACP) manages the bandwidth available during Multilink calls. Via BACP, a platform not initiating the call has the ability to negotiate bandwidth with the platform initiating the call. The negotiation can be based on available resources or through the dynamic monitoring of the actual traffic across the link. This solves the problem of insufficient bandwidth, which often occurs when ISDN links are repeatedly initialized and brought down (thrashing), by ensuring that both ends have adequate bandwidth for operation.

Data Compression

NauticaRS software enables the Marlin Network Access Servers to increase the amount of data that can be carried across an ISDN or leased line. Bay Networks routers provide the most comprehensive data compression support in the industry. This support ensures compression interoperability with a wide array of remote environments, ranging from third-party routers to Microsoft Windows workstations. Marlins use Lempel-Ziv-based STAC data compression techniques and support RFC 1962 — Compression Control Protocol (CCP) — along with Bay Networks WAN Compression Protocol (WCP). Microsoft Point-to-Point Compression (MPPC) is supported to optimize throughput in customer-specific applications. Bay Networks data compression support improves performance and throughput without compromising compatibility by using standards-based techniques.

Dial Services

Remote office connectivity and availability is ensured via NauticaRS dial-up services support, which includes Dial-on-Demand, Bandwidth-on-Demand, and Dial Backup for the Marlin Network Access Servers.

Marlins also support ISDN Terminal Adapters. This enables Marlin Network Access Servers to accept and make calls to standalone ISDN access routers that use PPP and PC/notebooks using integral or standalone ISDN Terminal Adapters supporting PPP or V.120.

Dial-On-Demand Marlin Network Access Servers take full advantage of the speed and bandwidth of ISDN lines while maintaining control of ISDN call costs. Its industry-leading features for minimizing line usage help network managers realize maximum cost savings with ISDN Dial-on-Demand connections for sites with intermittent data transfers. The Marlin Network Access Server brings up a link automatically when there is data to transfer and closes down the link once traffic has stopped for a specified amount of time.

Bandwidth-on-Demand Marlin Network Access Servers provide Bandwidth-on-Demand via Multilink PPP to provide additional bandwidth across an ISDN link during peak usage periods. BACP is used as the mechanism to add or delete links. Once line usage reaches a predefined level, the Marlin Network Access Server will open a second B-channel and load balance traffic across both channels. When line usage drops below the predefined level, the Marlin Network Access Server closes down one B-channel and returns to the original bandwidth. For Marlin Network Access Servers with ISDN interfaces, Bandwidth-on-Demand can be used to increase the synchronous port's bandwidth by using ISDN channels during peak traffic periods. Bandwidth-on-Demand can also be used to add bandwidth to ISDN B-channels that are already being used.

Dial Backup The Marlin Network Access Servers can use ISDN to back up a dedicated link. In the event that the dedicated link goes down, the Marlin Network Access Servers activate the ISDN connection in its place. When the dedicated link is restored, the Marlin Network Access Servers terminate the backup connection and resume use of the dedicated link.

Configuration and Management

Through NauticaRS, Bay Networks Marlin Network Access Servers provide many features that simplify configuration and provide SNMP-based network management capabilities. Marlin Network Access Servers can be configured and managed from any local or remote ANSI-standard terminal or from a PC on the network using Telnet. SNMP-based management systems including HP OpenView, Tivoli NetView for AIX, and Sun Microsystems Solstice Domain Manager can be used to manage a Marlin Network Access Server.

Bay Command Console (BCC) This terminal-based (TTY-compatible) tool enables local or remote platform installation and maintenance. It is accessed through a directly attached terminal or PC running terminal emulation software or a Telnet session. With support for BCC, NauticaRS provides command line syntax, which is consistent with other Bay Networks platforms that support BCC. This is ideal for situations where the management of the remote routers is being performed from a central site.

SeaView Bay Networks SeaView configurator is a Windows 95 Wizard application that provides an easy-to-use and consistent graphical user interface (GUI) to set up or make changes to Marlin Network Access Servers. Initial configuration of the Marlin is done using the Bay Networks SeaView Windows 95 Wizard set up facility. This allows users to configure the router quickly, easily, and accurately.

Security

Bay Networks NauticaRS enables authorized remote users to reach all the information they need while potential intruders are prohibited by its multilevel security features.

Marlin Network Access Servers support the Remote Authentication Dial-In User Service (RADIUS), a client/server-based security protocol. This enables the Marlin to provide a comprehensive set of security features and meet varied network requirements. Residing on a Windows 95 or Windows NT platform, and when used with the Marlin, RADIUS provides network-wide authentication and authorization to maintain security when remote access is required. Several levels of comprehensive security features are provided including Calling Line Identification (CLI) feature, which provides verification that incoming ISDN calls have authorization to connect. For PPP connections, PAP and CHAP are supported. Additionally, the Marlin Network Access Servers' RADIUS implementation will operate with other third-party RADIUS servers.

Technical Specifications

Technical specifications for the Bay Networks Marlin Network Access Server appear in Table 2.

Table 2 **Bay Networks Marlin Network Access Server Technical Specifications**

Size	[(H) 2.6 in. x (W) 9.4 in. x (D) 7.1 in. (65 x 238 x 180 mm)]
Weight	2Kg
Environmental	5% to 95% relative humidity, noncondensing; 5°C to 30°C
Power Supply	110 VAC, 60 Hz or 240 VAC, 50 Hz input; 9 VDC, 20 W (max)

System Requirements

The Marlin Network Access Server configurations described here are currently supported in software version 4.00, unless otherwise indicated in this document.

Ordering Information

Ordering information for the Bay Networks Marlin Network Access Server family of routers appears in Table 3.

Table 3 **Bay Networks Marlin Network Access Server Ordering Information**

V.35 WAN Interface	
DB1001?05	
Marlin 1000 Router:	Ethernet, V.35
DB1501?15	
Marlin 2100 Router:	Ethernet, V.35, (1) ISDN BRI
DB1501?16	
Marlin 2200 Router:	Ethernet, V.35, (2) ISDN BRI
DB1501?17	
Marlin 2300 Router:	Ethernet, V.35, (3) ISDN BRI
X.21 WAN Interface	
DB1001?03	
Marlin 1000 Router:	Ethernet, X.21
DB1501?09	
Marlin 2100 Router:	Ethernet, X.21, (1) ISDN BRI
DB1501?10	
Marlin 2200 Router:	Ethernet, X.21, (2) ISDN BRI
DB1501?11	
Marlin 2300 Router:	Ethernet, X.21, (3) ISDN BRI
WAN Cables	
CM0011031	X.21 cable 3 Meters
CM0011032	V.24 cable 3 Meters
CM0011033	V.35 cable 3 Meters

"?" in order number signifies country code where the choices are: E for North America, B for Europe, C for United Kingdom, P for Taiwan, and F for Australia.

For more sales and product information, please call **1-800-8-BAYNET**.

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